

ANALYSIS SEMINAR, OCTOBER 31, 2011

HARNACK INEQUALITY FOR A DEGENERATE ELLIPTIC EQUATION  
CRISTIAN GUTIERREZ

Abstract: In joint work with Federico Tournier, we obtain an invariant Harnack inequality for non negative solutions to degenerate elliptic equations of the form

$$a(x; y; z)X_1^2 u + 2b(x; y; z)X_1 X_2 u + c(x; y; z)X_2^2 u = 0,$$

where  $X_i; j$  are dened with the Heisenberg vector elds and the matrix coefficient is uniformly elliptic, and satisfying the additional condition that the ratio between the maximum and minimum eigenvalues is sufficiently close to one. In the paper we prove critical density and double ball estimates, once this is established, Harnack follows directly from the results of Gutierrez, Lanconelli and Di Fazio, *Mathematische Annalen*, 2008. Preprint available at <http://math.temple.edu/~gutierre/papers/harnack.subelliptic.final.version.june.28.2011.pdf>